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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,488	01/28/2002	Satoshi Shigematsu	96790p382	5883

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EXAMINER	
JERABEK, KELLY L	

ART UNIT	PAPER NUMBER
2622	

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04/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/059,488	SHIGEMATSU ET AL.	
	Examiner	Art Unit	
	KELLY L. JERABEK	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *5-10,12-16,19 and 20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,11,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 1/17/2008 have been fully considered but they are not persuasive.

Response to Remarks:

Applicant's arguments regarding claims 1 and 17 (Amendment pages 8-11) state that the counter disclosed by the Hou reference operates in synchronization with the photodetectors and therefore the counter (311) disclosed by the Hou reference does not operate independently of the plurality of sensors. The Examiner respectfully disagrees. Hou discloses a data conversion/output apparatus that includes a counter (311) which counts a clock signal (320) (col. 6, lines 45-58). The clock signal (320) is applied at mark time signal connector (310) from which the counter (311) counts the time marks in the clock signal (320) (col. 6, lines 47-50). **Additionally, Hou states that each of the latch circuits (314) latches respectively and independently the count number or time measured result when a corresponding gate circuit outputs a signal. In other words, one latch circuit latches in the count number when the corresponding photodetector has accumulated enough photons to reach the reference level (col. 6, lines 45-65).** Thus, it can be seen that the counter (311) operates independently of the plurality of sensors (the counter 311 continues counting

despite certain photodetectors accumulating enough photons to reach the reference level), and a maximum value of the counter is arbitrarily adjustable (the counter 311 maximum value depends on when each corresponding photodetector has accumulated enough photons to reach the reference level). The Examiner notes that although the counter (311) counts the time marks once light integration of the photodetectors starts and is reset at the end of light integration this does not mean that the counter does not operate independently of the plurality of sensors. In fact, because the counter continues counting even after certain photodetectors accumulating enough photons to reach the reference level it is clear that the counter operates independently of the plurality of sensors.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Hou (US 6,578,145.)

Re claim 1, Hou discloses a data conversion/output apparatus comprising a plurality of sensors (fig. 3, 302-1 – 302-n), voltage-time conversion circuits (fig. 3, 312-1 – 312-n) which are arranged adjacent to said respective sensors (fig. 3 302-1 – 302-n) and change output levels upon the lapse of times corresponding to output voltage values from said sensors after a conversion operation start point in order to convert voltage outputs of said sensors into times (col. 6 lines 41-44), and sensed data generation circuits (fig. 3, 314-1 – 314-n) for outputting, as digital data, lapse times until the output levels of said voltage-time conversion circuits change after a conversion start point (col. 6 lines 45-58), said sensed data generation circuits (fig. 3, 314-1 – 314-n) include a counter (311) for counting a clock signal (320) (col. 6, lines 45-58). The clock signal (320) is applied at mark time signal connector (310) from which the counter (311) counts the time marks in the clock signal (320) (col. 6, lines 47-50). Additionally, Hou states that each of the latch circuits (314) latches respectively and independently the count number or time measured result when a corresponding gate circuit outputs a signal. In other words, one latch circuit latches in the count number when the corresponding photodetector has accumulated enough photons to reach the reference level (col. 6, lines 45-65). Thus, it can be seen that the counter (311) operates independently of the plurality of sensors (the counter 311 continues counting despite certain photodetectors accumulating enough photons to reach the reference level), and a maximum value of the counter is arbitrarily adjustable (the counter 311 maximum value depends on when each corresponding photodetector has accumulated enough photons to reach the reference level).

Re claim 2, Hou discloses all of the limitations of claim 2 (see the 102(e) rejection to claim 1 supra), including disclosing a data conversion/output apparatus further comprising control means for sequentially supplying outputs from said voltage-time conversion circuits to said sensed data generation circuits (col. 5 lines 30-44.)

Re claim 3, Hou discloses all of the limitations of claim 4 (see the 102(e) rejection to claim 1 supra), including wherein said sensors are arranged in a matrix together with said corresponding voltage-time conversion circuits to constitute respective pixels (fig. 3, in which indicator 302 and indicator 312 can be interpreted as one unit), and said data conversion/output apparatus further comprises group selection means for selecting, from the pixels in a column direction, pixels which are aligned in a row direction and connected to one of said sensed data generation circuits (fig. 3., col. 5 lines 30-44.)

Re claim 4, Hou discloses all of the limitations of claim 4 (see the 102(e) rejection to claim 3 supra), including wherein said sensed data generation circuit includes a latch circuit for latching a count value after the conversion operation start point of said counter upon reception of an output from the voltage-time conversion circuit of each group-selected pixel (fig. 3A indicator 314-n, col. 6 lines 45-51.)

Re claim 11, Hou discloses all of the limitations of claim 11 (see the 102(b) rejection to claim 3 supra), including wherein said sensed data generation circuit includes a counter for counting a clock signal (fig. 3A indicator 311), and a latch circuit for latching a count value of said counter after a point offset from the conversion operation start point upon reception of an output from said voltage-time conversion circuit of each group-selected pixel (fig. 3A indicator 314-n, col. 7 line 17 – col. 8 line 15.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being obvious over Simoni et al. (A Digital Camera for Machine Vision"; employing Applicant's disclosure of this prior art as provided in relation to Figure 12 of Specification) in view of Hou (US 6,587,145.)

Re claim 17, Simoni, employing Applicant's disclosure of this prior art as provided in relation to Figure 12 of Specification, discloses a data conversion/output

apparatus including a column decoder for selecting at once a plurality of pixels aligned on an arbitrary column from pixels arrayed in a matrix (fig. 12 indicator 72), a plurality of data buses each commonly connected to a plurality of pixels aligned on each row out of the pixels (fig. 12 indicator 74), a counter for sequentially outputting count values in accordance with internal count operation (fig. 12 indicator 76), a plurality of latch circuits which are arranged on respective rows and latch the count values from said counter in accordance with level changes of said data buses corresponding to the respective rows (fig. 12 indicator 77), a row decoder for selecting a row having a desired pixel out of the pixels selected by said column decoder (fig. 12 indicator 73), and a plurality of row switches which are arranged on the respective rows and output as sensed data of desired pixels the count values latched by said latch circuits corresponding to the respective rows (fig. 12 indicator 75), wherein each of the pixels has a sensor for outputting a detection result as an output voltage value (fig. 12 indicator 73), and a column switch for outputting in accordance with selection of a pixel by said row decoder an output to a data bus connected to the pixel (Specification – fig. 12 indicator 63.) However, Simoni does not disclose a voltage-time conversion circuit for changing an output level upon the lapse of time corresponding to an output voltage value from said sensor after a predetermined conversion operation start point and further does not disclose a counter for sequentially outputting count values in accordance with internal count operation and for operating independently of each sensor in each pixel of the matrix, and a maximum value of the counter is arbitrarily adjustable.

Nevertheless, Hou discloses a data conversion/output apparatus that includes a voltage-time conversion circuit that changes an output level upon the lapse of time corresponding to an output voltage value from said sensor after a predetermined conversion operation start point (col. 3 line 4 col. 4 line 52). Additionally, Hou discloses sensed data generation circuits (fig. 3, 314-1 – 314-n) that include a counter (311) for sequentially outputting count values in accordance with an internal count operation (320) (col. 6, lines 45-58). The clock signal (320) is applied at mark time signal connector (310) from which the counter (311) counts the time marks in the clock signal (320) (col. 6, lines 47-50). Additionally, Hou states that each of the latch circuits (314) latches respectively and independently the count number or time measured result when a corresponding gate circuit outputs a signal. In other words, one latch circuit latches in the count number when the corresponding photodetector has accumulated enough photons to reach the reference level (col. 6, lines 45-65). Thus, it can be seen that the counter (311) operates independently of the plurality of sensors (the counter 311 continues counting despite certain photodetectors accumulating enough photons to reach the reference level), and a maximum value of the counter is arbitrarily adjustable (the counter 311 maximum value depends on when each corresponding photodetector has accumulated enough photons to reach the reference level). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the voltage-time conversion circuit and the counter of the data conversion/output apparatus as taught by Hou with the data conversion/output apparatus as taught by Simoni, in order to produce signals of higher fidelity, as well as to accomplish A/D conversion

within a pixel without requiring each pixel to have the extra circuitry and costs associated with conventional A/D circuits ('030 – col. 1 lines 33-62.)

Re claim 18, Simoni and Hou disclose all of the limitations of claim 17 (see the 103(a) rejection to claim 17 supra), including disclosing a data conversion/output apparatus further comprising a plurality of output-side latch circuits which are interposed between said latch circuits and said row switches for the respective rows, latch outputs from said latch circuits in accordance with a predetermined data reception signal, and output the outputs to said switches (Figure 12 of Specification, indicator 77.)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly L. Jerabek whose telephone number is **(571) 272-7312**. The examiner can normally be reached on Monday - Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached at **(571) 272-7372**. The fax phone number for submitting all Official communications is **(571) 273-7300**. The fax phone number for submitting informal communications such as drafts, proposed amendments, etc., may be faxed directly to the Examiner at (571) 273-7312.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Kelly L. Jerabek/

Examiner, Art Unit 2622

/James M Hannett/

Primary Examiner, Art Unit 2622